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(54) **Lacing system for footwear**

(57) A footwear lacing system having a detachable tongue that is attached to shoe-mounted rings and splayed by a shoelace is disclosed. The tongue includes a main body and radially extending fingers that form loops for receiving a shoelace. Rings, attached to the shoe, are configured to receive the fingers. Thus, the tongue is attached to the shoe by placing it over a throat of the shoe and placing the fingers through appropriately located rings. The fingers are thereafter double-backed toward a proximal midline of the shoe, and the shoelace is threaded through the fingers and tightened, causing the tongue to splay, thereby securing the shoe on a wearer's foot. Alternatives are disclosed including asymmetrical tongues, collar straps, and wherein the shoelace is threaded through a combination of fingers and conventional eyelets.

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## Description

### BACKGROUND OF THE INVENTION

#### Field of the Invention

This invention pertains to a lacing system for footwear.

#### Description of the Related Art

The most common example of a prior art lacing system is a shoelace which is placed through eyelets located on opposite sides of a throat opening in an upper of footwear. A tongue is often located within the throat and is sewn to the shoe's vamp. Tightening the shoelace pulls against the opposed medial and lateral sides of the throat so as to pull the shoe's upper tight over a wearer's foot. The tongue provides material within the throat so as to prevent exposure of the foot along the throat opening and to act as a force plate distributing pressure from the shoelace on the foot.

Another example of a lacing system is Sego, U.S. Patent No. 1,600,851, which discloses a closure device that attaches to rows of buttons located on opposite sides of a throat. Sego does not disclose any shoelace, nor any other means for tightening the closure onto the shoe.

Keenan, U.S. Patent No. 1,471,035, discloses a detachable trim piece that can be attached to shoes by means of a shoelace. The trim is detachable so an owner of the footwear can replace the trim with alternative colors to coordinate with different outfits. The trim piece is designed to completely circumscribe the shoe upper and sole, and then a shoelace is conventionally threaded through eyelets on the trim piece to provide an appearance of a standard shoe with a standard lacing system.

Prior art lacing systems have been generally effective at holding a shoe on a user's foot. However, prior art lacing systems can cause an excessive amount of pressure on the top of the wearer's foot which can affect wearer comfort and proper circulation. Additionally, some high performance footwear intended for athletic activity now includes an inner layer generally referred to as a sock liner which necessitates alternative designs for lacing systems because conventional tongues that are sewn to shoe vamps have often proven deficient.

### SUMMARY OF THE INVENTION

The present invention comprises a lacing system for securing footwear to a foot of a user. The lacing system includes a separate tongue, a plurality of rings attached to the footwear and a shoelace.

The tongue includes a main body portion and a plurality of distally located loop appendages or fingers, which are generally radially oriented relative to its main body. The tongue further includes a top, plunging mar-

gin forming a throat-like opening which is intended to be generally aligned with the throat of the shoe.

The rings are preferably securely attached to the shoe upper or sole and positioned on lateral and medial sides of the shoe. The rings are sized to receive the tongue's loop appendages. Rings may also be located on the shoe's vamp or its sole.

The tongue is attached to the shoe by passing the appendages through the rings. The appendages are then doubled back on themselves, and a shoelace is threaded through them to pull their distal ends toward a proximal axis of the shoe thus splaying the body of the tongue so it tightens onto the wear's foot.

A preferred embodiment of the present invention includes a tongue having a symmetrical main body and three loop appendages along medial and lateral sides of the body. The appendages pass through appropriately located rings that are attached to the shoe upper. A shoelace is passed through all the appendages and tightened. The preferred embodiment includes three appendages on each side of the tongue because of its trademark significance, but a greater or lesser number of appendages could provide the functional advantages of the invention.

Alternative preferred embodiments include a tongue having a loop appendage located at a middle of a lower edge, which connects to a ring located on the shoe's vamp.

A further preferred embodiment includes a tongue body having a rearward extending strap that forms a loop around a wearer's ankle. The strap includes an adjustment mechanism for providing a snug fit.

A further preferred embodiment includes an asymmetrical tongue having asymmetrically located loop appendages on a medial side as compared to its lateral side. The asymmetrical loops can be positioned to improve lateral stability of a wearer of the shoe.

A further alternative embodiment of the present invention includes a pair of rings interconnected by a strap passing through the sole of the footwear. Thereafter, a tongue having appropriately arranged loops is positioned on the shoe and the loops are inserted through the rings and thereafter tightened with a shoelace.

Further alternative embodiments can include a greater or lesser number of tongue loops, alternatively configured loops, and various configurations of rings including D-rings, fabric rings and "C"-shaped plastic devices that only form a ring-like enclosure when attached to the shoe.

Various advantages and features of novelty which characterize the invention are particularized in the claims forming a part hereof. However, for a better understanding of the invention and its advantages, reference should be had to the drawings and to the accompanying description in which there is illustrated and described preferred embodiments of the invention.

## BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a top plan view of a preferred embodiment of a tongue of the present invention having one appendage turned up into perspective.

Fig. 2 is a perspective view of the preferred embodiment of Fig. 1 shown in its environment attached to a shoe.

Fig. 3 is a perspective view of an alternative embodiment of a tongue of the present invention.

Fig. 4 is a perspective view showing the tongue of Fig. 3 in its environment on a shoe and including a ring-strap located through the shoe's midsole.

Fig. 5 is a perspective view of an alternative embodiment of a tongue of the present invention.

Fig. 6 is a perspective view of an alternative embodiment of a tongue of the present invention.

Fig. 7 is a perspective view of a preferred embodiment of an asymmetric tongue of the present invention shown mounted on a shoe.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Fig. 1 shows a preferred embodiment of a detachable tongue 10 of the present invention. The tongue comprises a main proximal body 12 having numerous outwardly extending, distal fingers or appendages 14a-14f. Preferably, the fingers are loops of inelastic fabric sewn to the main body 12.

Fingers 14 may include multiple overlaying layers of fabric, including an exterior fabric 16 and a wider interior fabric 18. The properties of the two fabrics may differ to accommodate various functional or aesthetic purposes. For example, the exterior fabric 16 may be a light-reflecting surface to provide safety for runners during nighttime or it may be a colorful band of fabric for decorative purposes. In a similar fashion, the interior fabric 18 may provide a contrasting color for decorative purposes. Alternatively, fabrics 16 and 18 may be selected to provide an outer wear resistant surface and an inner high-strength, inelastic material.

As noted, the fingers 14 are preferably loops of fabric. Accordingly, the loops form apertures 28 which extend from the body 12 to distal ends 30 of the fingers. The apertures are provided to receive a shoelace 32 as shown in Fig. 2 and described below.

The tongue 10 further includes a top margin 20 having a plunging neckline, or throat 22. In addition, the tongue 10 includes a lower margin 24. Preferably, the fingers 14 are attached to extensions 26 which form a portion of the main body 12. Alternatively, the main body 12 could provide a smoother margin having indiscernible extensions 26, in which case the fingers 14 would be attached to the smooth margin of the main body 12.

The tongue 10 shown in the embodiment of Fig. 1 is symmetrical about a proximal, longitudinal axis 27 which extends down the middle of throat 22, across the main body 12, and over a midpoint of the lower margin

24. Alternative embodiments of tongue 10 may be asymmetrical about the proximal axis or have asymmetrically located fingers 14.

The tongue 10 is shown on a shoe 34, which is represented in Fig. 2 as an athletic shoe having a heel counter 36 and a toe counter 38 mounted onto an upper 40 which is fixedly connected to a sole 42. The shoe 34 further includes a vamp 44, a collar 46, and a throat 48. The shoe 34 may further include a sock liner (not shown). In addition to the athletic shoe 34 shown in Fig. 2, the tongue 10 of the present invention may be adapted to alternative styles of footwear including, but not limited to, dress shoes and boots.

To receive the tongue 10 of the present invention, the shoe 34 is provided with a plurality of annular rings 50a-50f that are fixedly attached to the shoe 34 and adapted to accept the fingers 14a-14f, respectively. The view of Fig. 2 shows a lateral side 52 of the shoe 34. Accordingly, only rings 50d-50f, located on the lateral side of the shoe 34, can be seen. Those rings 50d-50f located on the lateral side 52 interact with fingers 14d-14f located along a lateral margin 54 of the tongue 10. Similarly, rings 50a-50c (not seen in Fig. 2) located along a medial side 56 of the shoe 34 interact with fingers 14a-14c, which depend from a medial margin 58 of tongue 10.

All the rings 50 as shown in the present embodiment are fixedly located to the upper of the shoe 34. Alternatively, the rings 50 could be fixedly attached to the sole 42, or any combination of the upper and sole. Furthermore, the present embodiment is shown with three fingers 14 along the lateral and medial margins, respectively, of the tongue 10, however, alternative embodiments could include a greater or lesser number of fingers 14. The number of rings 50 could coincide exactly with the number of fingers 14, or alternatively, a greater or lesser number of rings 50 could be provided so that users of the present system could have alternative, or custom, lacing options.

As generally noted above, and as shown in Fig. 2, the tongue 10 attaches to the shoe 34 by inserting the fingers 14a-14f through respective rings 50a-50f which are attached to the shoe 34. Thereafter, the distal ends 30 of the fingers 14 are double-backed and arranged generally towards the proximal axis 27 of the tongue 10, and the lace 32 is threaded through the apertures 28, thereby pulling the distal ends 30 toward the proximal axis of the tongue. Tightening the lace 32 further urges the distal ends 30 towards the proximal axis thereby placing the fingers 14 in tension which is communicated to the main body 12 of the tongue 10 thereby splaying the tongue, pulling it taut over the throat 48 of the shoe 34. When the shoe 34 is placed on a wear's foot, the tightening of the lace 32 will cause the tongue 10 to be pulled taut over an instep of the wearer, thereby tightening the shoe 34 onto the wearer's foot.

It should be specifically noted that the present system pulls taut the body 12 which has a relatively large surface area. Prior art lacing systems apply tension

directly from the lace onto a tongue which is hingedly connected to the vamp of the shoe. Accordingly, the taut lace would cause pressure points on a wearer's foot. The present invention eliminates or substantially reduces those pressure points by spreading the taut surface over the entire surface area of the body 12 of the tongue 10. Accordingly, the wearer experiences significantly greater comfort even with tightly laced footwear.

The rings 50 are shown in a preferred embodiment in which the rings are plastic D-rings sewingly affixed to the shoe upper 40. Alternative configurations of rings 50 include fabric loops and metal rings. Additionally, the rings may be configured as O-rings, square or rectangular rings, or C-rings having distal ends that are fixedly attached to the shoe.

The fingers 14 may be configured as cords having a first end attached to the tongue body 12 and a second end attached to a ring-like device thereby providing distally located aperture 28.

An alternative embodiment of tongue 110 of the present invention is shown in Figs. 3 and 4. Tongue 110 includes fingers 114a-114c having distal apertures 128 and further including a throat 122. The tongue 110 is shown attached to a shoe 134 in Fig. 4. Shoe 134 includes a ring 150a mounted onto a vamp 144 of the upper 140 and rings 150b and 150c mounted on lateral 152 and medial 156 sides of the shoe, respectively (ring 150b is not visible in Fig. 4). The rings 150 of Fig. 4 further include an alternative embodiment in which the medial and lateral rings 150b and 150c, respectively, are interconnected by a strap 160, which passes through a channel 162 located in a midsole portion of the sole 142. Alternatively, the strap 160 may transversely circumscribe an outer surface of the sole 142 to interconnect the medial and lateral rings 150b and 150c, respectively.

In the embodiment of Figs. 3 and 4, lace 132 passes through the three fingers 114a-114c and thereafter passes through eyelets 164 (only one shown) located along a margin of throat 148 of shoe 134. Alternatively, the tongue 110 could be extended upwards toward the collar 146 and include extra fingers 114 which would interact with additional, respective, rings 150 attached to the shoe 134. If the tongue 110 were to extend to the top of the throat 148 and the tongue 110 were provided with additional fingers 114, then the lace 132 would interact entirely with apertures 128 and the shoe 134 need not be provided with eyelets 164.

Additional embodiments of the tongue of the present invention are shown in Figs. 5 and 6. In Fig. 5, there is shown a tongue 210 having a vamp finger 214a and lateral and medial fingers 214b and 214c, respectively. Tongue 210 further includes an ankle strap 266 intended to follow and circumscribe a collar of a shoe such as collars 46 and 146 shown in Figs. 2 and 4, respectively. The collar 46 could be provided with a sleeve (not shown) for receiving the strap 266. The ankle strap 266 further includes an adjustable buckle

268 for adjusting the size of the ankle strap 266. The tongue 210 would be mounted on a shoe in a manner similar to tongue 110 of Fig. 4. The tongue 210 further includes a throat 222.

A further alternative embodiment is shown in Fig. 6 in which a tongue 310 includes medial fingers 314f and an ankle strap 366 having an adjustable buckle 368. Tongue 310 would be mounted to a shoe similarly to tongue 10 as shown in Fig. 2 except for the ankle strap 366, which would circumscribe collar 46.

A further alternative embodiment is shown in Fig. 7 in which tongue 410 is asymmetrical about its proximal axis 427 and includes asymmetrically located medial fingers 414a and 414b and lateral fingers 414c and 414d (not shown). When attached to a shoe 434 as shown in Fig. 7, the medial fingers 414a and 414b are on a medial side 456 of the shoe, and lateral fingers 414c and 414d are on a lateral side 452 of the shoe. The fingers 414a and 414b are located near a top 420 and bottom 424 of the tongue and connect to rings 450a and 450b that are located near a toe counter 438 and a heel counter 436, respectively. Fingers 414c and 414d connect to rings 450c and 450d (not shown). Ring 450c (not shown) is located near the toe counter 438 roughly symmetrical with ring 450a. Ring 450d (not shown) is located approximately midway between the toe counter 438 and the heel counter 436 on the lateral side 452 of the shoe 434. Additionally, the upper 440 of the shoe 434 is provided with eyelets 464a and 464b (not shown). Eyelet 464b is located near the top of the throat 448 on the lateral side. A lace 432 passes through fingers 414a and 414c and then passes through finger 414d and eyelet 464a. Thereafter, the lace passes through finger 414b and eyelet 464b before being tied off at the top of the throat 448.

By providing an asymmetrical tongue 410, the present embodiment provides a means for controlling lateral stability of a runner's foot while wearing the shoe 434. For example, the embodiment shown in Fig. 7 provides support against pronation because of the orientation of the fingers 414, particularly finger 414b, which is located to resist pronating movement. Conversely, the tongue could be provided in a mirror image to resist supination of the foot.

Although various embodiments are disclosed, all share the characteristic of a tongue having distally located "finger-like" loops that are generally radially arranged on a central body portion. All embodiments further include ring-like devices attached to the shoe upper or sole, which receive the loops. After passing through the ring-like devices, the loops are folded back over themselves so their ends are oriented toward a proximal, longitudinal midline of the tongue. A shoelace is then inserted through the loops such that tightening the lace further pulls the loop ends toward the midline, thus causing the tongue to splay and be pulled downward onto the top of a wearer's foot.

Numerous characteristics and advantages of the invention have been set forth in the foregoing descrip-

tion, together with details of the structure and function of the invention. The novel features hereof are pointed out in the appended claims. The disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the principle of the invention to the full extent indicated by the broad general meaning of the terms in the claims.

## Claims

1. A shoe having a sole, an upper, a detachable tongue having a plurality of shoelace receptors, a shoelace, and a plurality of tongue receptors attached to the shoe, wherein the tongue is arranged so the shoelace receptors are engaged with the tongue receptors and the shoelace is arranged to be engaged with the shoelace receptors so as to prevent disengagement of the tongue from the tongue receptors and retain the shoe on a wearer's foot.
2. The shoe of claim 1, characterized by at least one of the following features:
  - a. the tongue receptors comprise annular devices attached to the shoe;
  - b. the tongue receptors are attached to the upper;
  - c. the tongue receptors are attached to the sole;
  - d. at least one tongue receptor is attached to the upper along a proximal axis of the shoe and at least one tongue receptor is attached to a medial side of the shoe and at least one tongue receptor is attached to a lateral side of the shoe;
  - e. two tongue receptors are located on opposite sides of the shoe and are interconnected by a strap passing beneath the upper.
3. The shoe of claim 1 wherein the shoe upper defines a collar and the tongue includes a strap that circumscribes the collar when the tongue is attached to the tongue receptors.
4. The shoe of claim 1 wherein the shoelace receptors comprise fabric loops.
5. The shoe of claim 1 wherein the shoelace receptors comprise medial loops arranged along a medial margin of the tongue and lateral loops arranged along a lateral margin of the tongue and the tongue is engaged with the tongue receptors such that the medial loops extend from the medial margin of the tongue and engage tongue receptors on a medial side of the shoe and thereafter extend back toward a proximal axis of the tongue and the lateral loops extend from the lateral margin of the tongue and engage with tongue receptors along a lateral side of the shoe and thereafter extend back toward the proximal axis.
6. The shoe of claim 1 wherein the shoelace is taut, causing the tongue to splay.
7. A shoe, comprising a sole, an upper having an instep portion, a tongue having a plurality of outward extending fingers defining distally located apertures, annular devices that are fixedly attached to the shoe, and a shoelace wherein the fingers are located through the annular devices and the shoelace is located through the apertures in the fingers, thereby splaying the tongue when the shoelace is taut.
8. The shoe of claim 7, characterized by at least one of the following features:
  - a. the tongue is detachable from the shoe when the shoelace is disengaged with the apertures in the fingers of the tongue;
  - b. at least one annular device is located on a medial side of the shoe, and at least one annular device is located on a lateral side of the shoe.
9. The shoe of claim 7 wherein the fingers are located along medial and lateral margins of a main tongue body and the fingers along the medial margin engage rings attached to a medial side of the shoe and fingers along the lateral margin engage rings attached to a lateral side of the shoe thus aligning the main tongue body over a proximal axis of the shoe, the fingers engaging the rings and the shoelace engaging the fingers such that tension in the shoelace urges distal ends of the fingers toward the proximal axis of the shoe.
10. A lacing system for a shoe comprising:
  - a. a tongue having a proximal body and fingers defining openings at distal ends thereof;
  - b. a plurality of tongue receptors; and
  - c. a shoelace having first and second ends and a bight located between the ends;
  - d. wherein individual fingers are engaged with individual tongue receptors and the shoelace is arranged through the openings in the fingers such that distal ends of the fingers are urged generally toward a proximal centerline of the tongue body when the shoelace is taut.
11. The lacing system of claim 10, characterized by at least one of the following features:
  - a. the tongue receptors comprise annular rings;

- b. the fingers comprise loops fixedly attached to the proximal body of the tongue;
- c. the tongue receptors include at least two interconnected tongue receptors;
- d. the tongue further comprises a strap extending from a top margin on the tongue and forming an aperture. 5

12. A tongue for a shoe, comprising a proximal main body having appendages including fingers defining distally located apertures. 10

13. The tongue of claim 12, characterized by at least one of the following features: 15

- a. the fingers are loops sewingly attached to the tongue body;
- b. the tongue body includes a plunging upper margin defining a throat;
- c. the tongue is symmetrical about a longitudinal, proximal axis; 20
- d. a strap extending from an upper margin of the tongue body;
- e. an adjustable strap forming a loop and extending from a medial edge and a lateral edge of the tongue body; 25
- f. the fingers are asymmetrically located relative to a proximal centerline of the main body for controlling pronation of a wearer's foot during ambulation. 30

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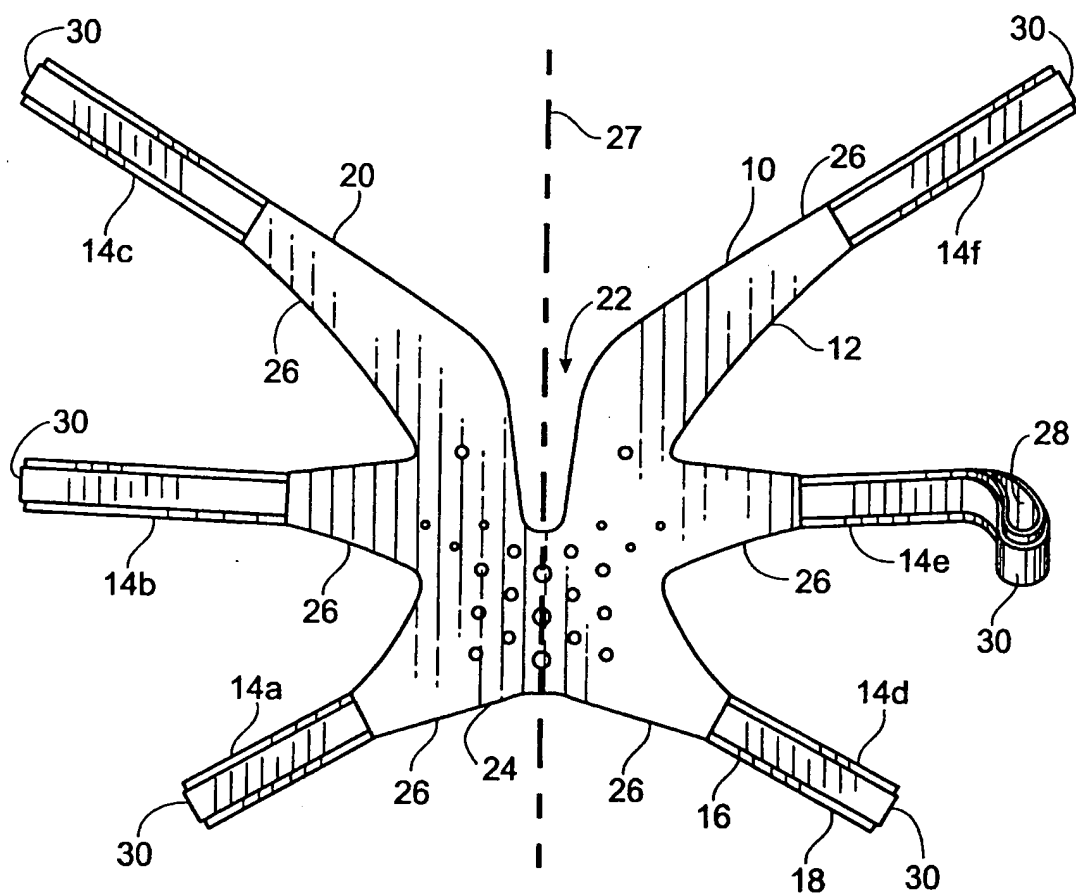


Fig. 1

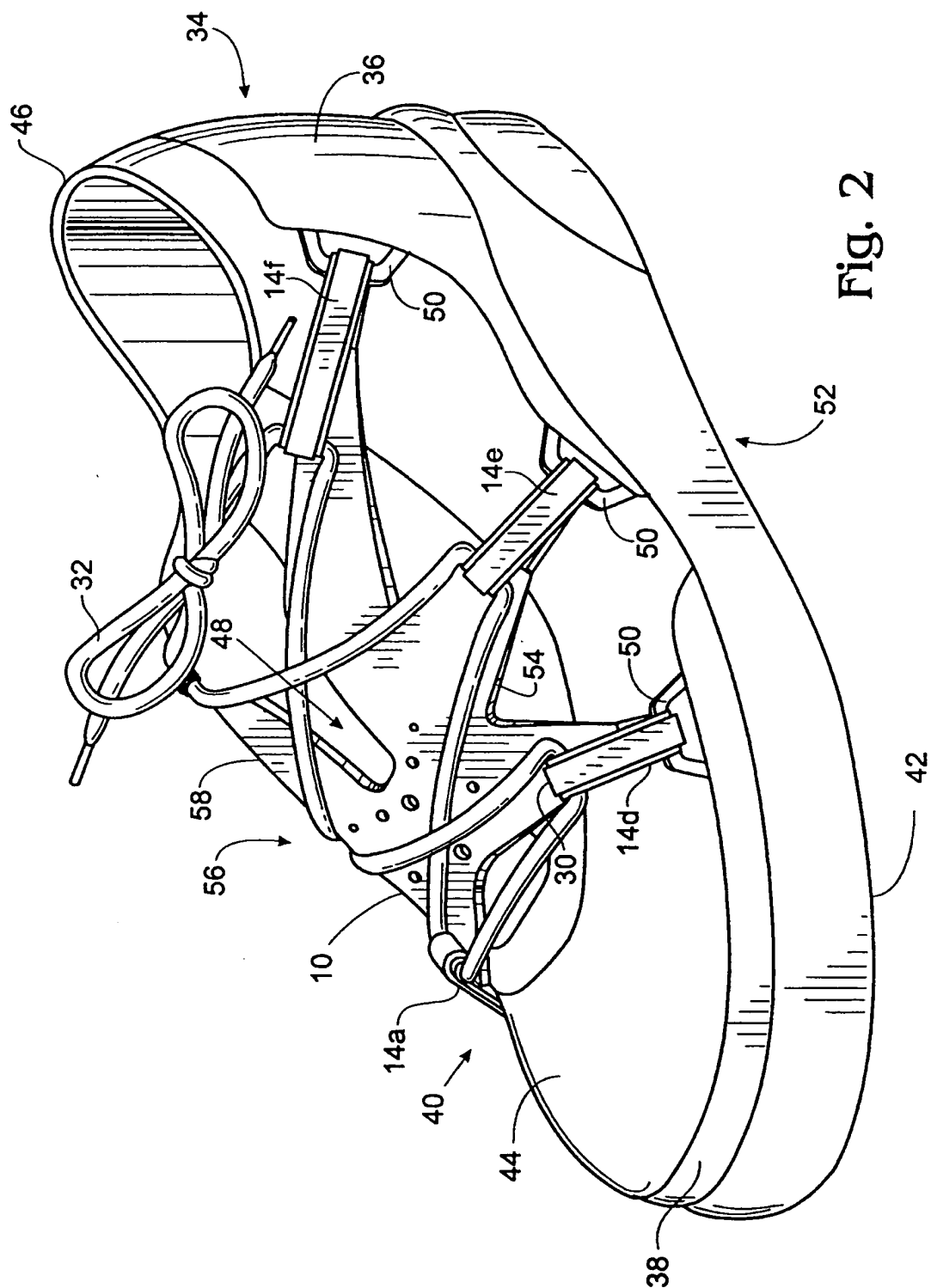
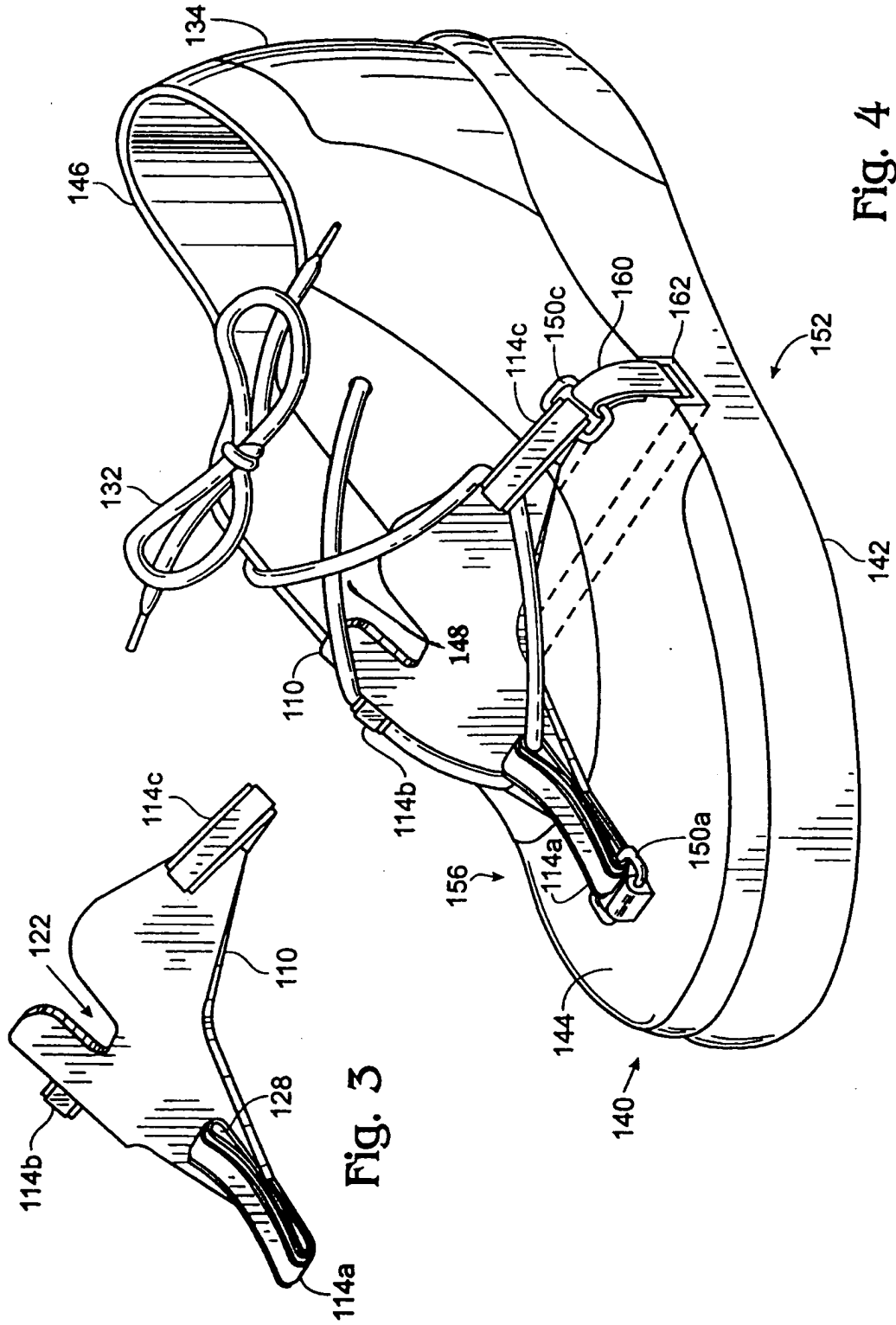


Fig. 2





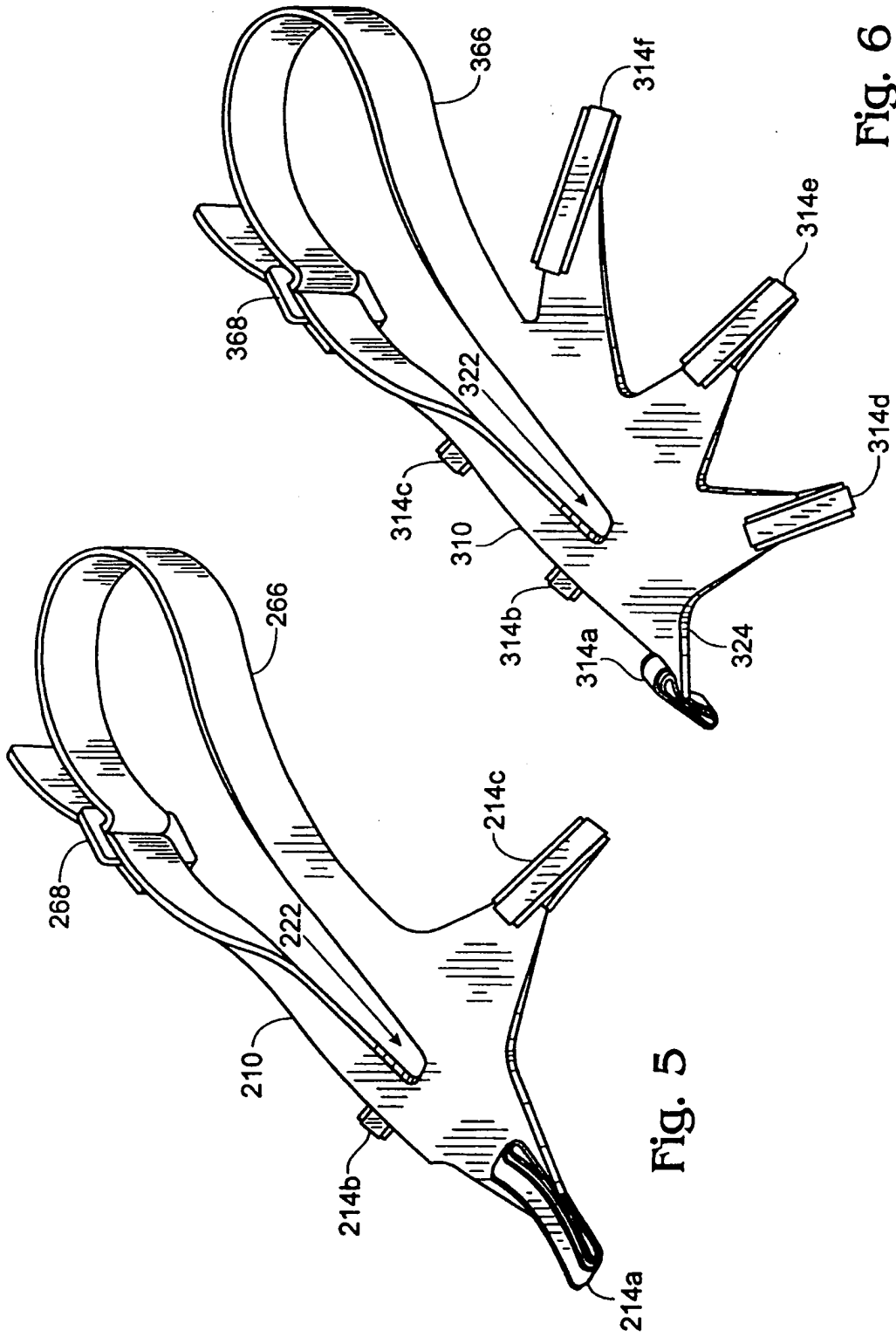


Fig. 5

Fig. 6

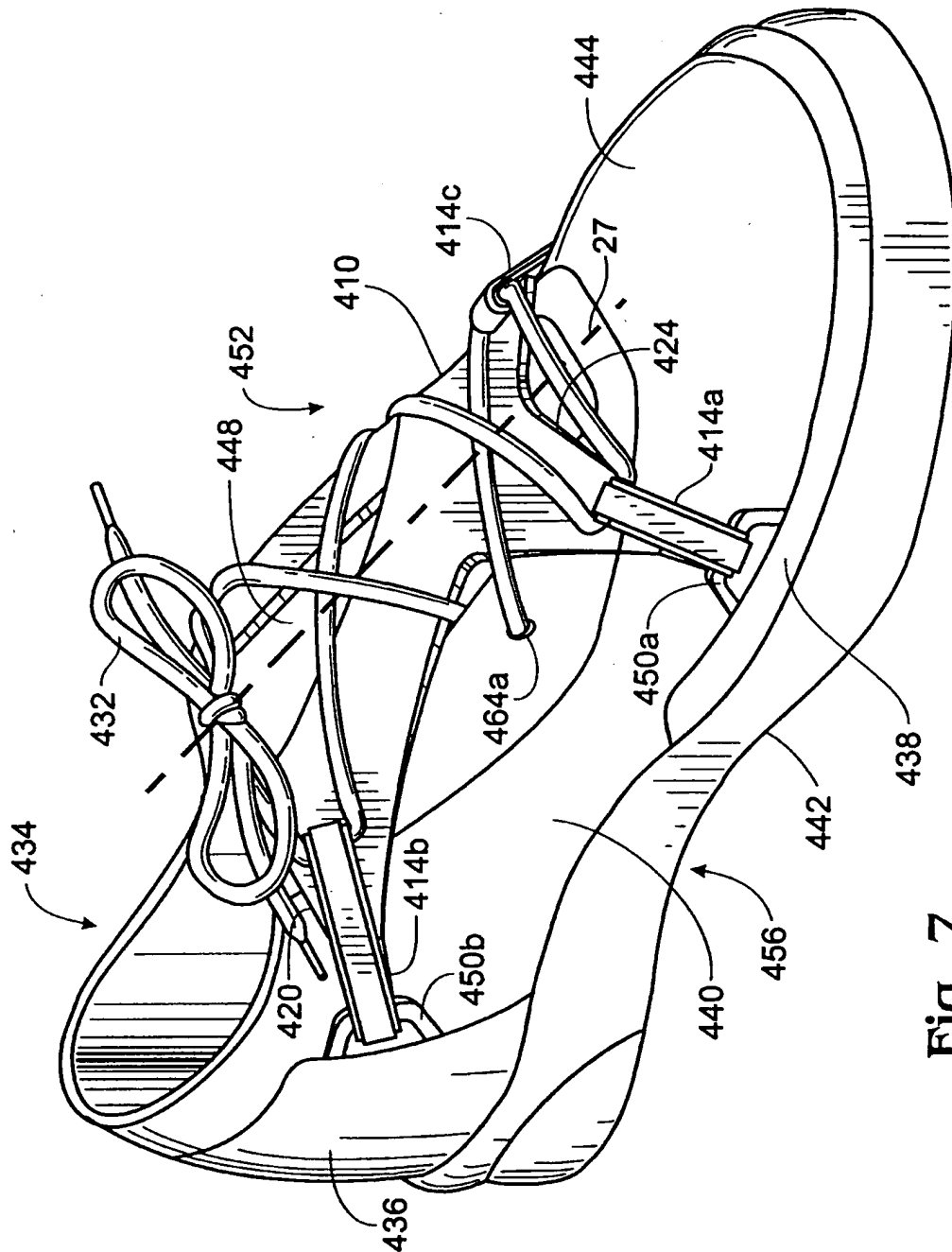


Fig. 7



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# EUROPEAN SEARCH REPORT

Application Number  
EP 96 10 5070

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US-A-4 817 303 (L. SELBINGER) * the whole document *	1,10,12	A43C1/00 A43B23/26
A	US-A-5 377 430 (T. L. HATFIELD) * the whole document *	1,10,12	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A43C A43B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11 July 1996	Examiner Declerck, J
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